

IN THE U.S. PATENT AND TRADEMARK OFFICE

APPLICANT:

Fujimori Kogyo Co., Ltd.

FOR:

GUSSET BAG AND METHOD OF PRODUCING THE SAME

D E C L A R A T I O N

Honorable Commissioner of Patents

Washington, D.C. 20231

Sir,

I, Takashi Kojima, a patent attorney of Ginza Ohtsuka Bldg., 2F, 16-12, Ginza 2-chome, Chuo-ku, Tokyo, Japan do hereby solemnly and sincerely declare:

1) THAT I am well acquainted with Japanese language and English language;

2) THAT the attached is a full, true and faithful translation into English made by me of the PCT application of which number is PCT/JP03/10341, filed in Japan on the 14 August 2003.

3) THAT I declare further that all statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both, under Section 1001 of Title 18 of the United States Code and that such willful statements may jeopardize the validity of the application or any patent issued thereon.

AND I being sworn state that the facts set forth above are true.

Dated this 14<sup>th</sup> day of February 2005

  
Takashi KOJIMA

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DESCRIPTION

## GUSSET BAG AND METHOD OF PRODUCING THE SAME

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TECHNICAL FIELD

The present invention relates to a gusset bag having flexibility and at the same time good self-standing property and also having high bonding strength of a spout, and a  
10 method of producing such a gusset bag.

BACKGROUND ART

Among conventional packaging containers (bags) for filling liquids or the like, there is known a gusset bag made  
15 of a flexible packaging material which is mainly composed of a plastic film.

The conventional gusset bags, however, have the disadvantages that the self-standing property is gradually injured as the content filled therein is decreased and the  
20 upper part thereof is bent down, thereby losing the self-standing property. Especially, the gusset bags for filling liquids usually have a spout for flowing out the content. In that case, the upper part of the gusset bag is heavy, and it is clear that the gusset bag tends to lose the  
25 self-standing property as the content is getting decreased. The usual method for producing a gusset bag having a spout comprises preparing a bag body by fusion bonding the predetermined parts of the peripheral edges of sheets, independently molding a spout, manually inserting the spout  
30 between the sheets forming the bag body and fusion bonding the spout with the inner faces of the sheets to attach the spout to the bag body. Such manual operation is unfavorable to mass production, and is insufficient in fusion bonding between the spout and the sheets, resulting in insufficient  
35 bonding strength thereof. On the other hand, molded containers have rightfully a sufficient self-standing

property. However, it is unable to fold the containers into a smaller size when discarded.

#### DISCLOSURE OF THE INVENTION

5           The present invention has been completed in view of the above circumstances. It is an object of the present invention to provide a gusset bag which retains its self-standing property until the content filled therein is completely consumed, is capable of folding into a small size  
10 when discarded, and has a high attachment strength of a spout, and also to provide a method for producing such a gusset bag.

          The present invention provides the following gusset bag and method of producing the gusset bag in order to attain the above object.

15 [I]     A gusset bag having side films folded inwardly and an opening portion at the upper edge of the bag, said gusset bag further having a reinforcing resin layer at least on the side edge.

[II]    The gusset bag of [I] wherein the reinforcing resin  
20 layer is further provided on the upper edge.

[III]   The gusset bag of [II] wherein a spout is provided at the opening portion with bonding to the reinforcing resin layer.

[IV]    The gusset bag of [III] wherein the reinforcing resin  
25 layer and the spout are integrally molded.

[V]     A method for producing a gusset bag having side films folded inwardly and an opening portion at the upper edge of the bag comprising:

          injecting a resin to the side edge of the gusset bag  
30 or the side edge and the upper edge of the gusset bag to form a reinforcing resin layer.

[VI]    The method of producing the gusset bag of [V] wherein the spout is formed at the opening portion and the reinforcing resin layer is formed integrally with the  
35 spout by injecting the resin.

          In the gusset bag of the present invention, the reinforcing resin layer, especially one on the side edge,

constitutes a so-called rib of the bag body and functions as a support of the bag, thereby improving the self-standing property of the bag body and retaining its sufficient self-standing property until the content is completely discharged even in the case where the bag is provided with a spout. In the case where the spout is integrally molded with the above-described resin layers, the bag has an excellent attachment strength of the spout.

The reinforcing resin layer on the side edge will exert its reinforcing effect so long as it is formed at least at one of four side edges, although it is effective to form the layer preferably at two side edges, more preferably at all the four side edges. Moreover, the reinforcing resin layer may be formed on at least part of one side edge, although the layer can be formed along the entire length of one side edge from the upper end to the lower end.

The reinforcing resin layer may be formed on any portion of the side edge including a ridgeline, an inside part of the folded gusset (a side film site), a front surface site or a rear surface site. In case that the layer is formed only on the front surface site and/or the rear surface site, the gusset bag is easy to fold and the reinforcing resin layer is easy to form. Especially, it is preferable that the reinforcing resin layer extends over from the side edge portion, which will spread when content is filled, to the upper edge, since the gusset bag is easy to unfold.

The spout is used as a nozzle especially when the content of the gusset bag is a liquid. It is preferable that the spout is integrally molded with the reinforcing resin layer from the viewpoint of retaining the self-standing property of the gusset bag and the attachment strength of the spout.

The spout may be integrally molded simultaneously with molding the reinforcing resin layer. The spout previously molded may be integrated with the reinforcing resin layer by in-mold molding when the layer is molded. In this case, the spout is preferably bonded with the reinforcing resin layer.

The gusset bag of the present invention should desirably be produced by forming the bag body in the conventional procedure and then the reinforcing resin layer on the upper edge or the side edge of the bag body should be formed. But, even if the upper edge or the side edge is not bonded or the side edge is bonded with so slight bonding strength that the bag body manages to keep its shape when the bag body is formed, it is preferable that the reinforcing resin layer is formed so as to cover the upper edge or the side edge, thereby enabling to strengthen the bonding strength and to bond the side edge of the bag body firmly.

#### BRIEF DESCRIPTION OF THE DRAWING

Fig. 1 is a schematic perspective view illustrating the structure of the gusset bag according to the present invention.

#### BEST MODE FOR CARRYING OUT THE INVENTION

One embodiment of the present invention will be described with reference to the accompanying drawing. Fig. 1 shows a gusset bag body having a rectangular bottom part 2, a front surface part 3, a rear surface part 4, and two side films 5 and 6. Both the side films are provided so that they are able to fold inwardly. In the state that both the side films 5 and 6 are folded inwardly, the bottom part 2 may be formed as a style of a square bottom bag which can be folded toward the rear surface part 4.

The upper edge 7 of the bag body 1 is formed by superposing the upper edges of the front and rear surface parts 3 and 4 each other and bonding them so that an opening portion is formed at the center of the upper edge thereof. To the opening portion is attached a spout 9.

The reinforcing resin layer 10 is formed on the upper edge 7 of the bag body 1 and on only the front surface site 3 and the rear surface site 4 of each side edge. In the illustrated embodiment, the reinforcing resin layer 10 formed on each side edge extends to the vicinity of the lower end of

each side edge. The reinforcing resin layer should desirably be formed such that they extend at least from the upper portion, preferably at least the upper end portion of each side edge to the middle of the side edge along with each edge line. Needless to say, the reinforcing resin layer may extend over the entire length of each side edge.

In the illustrated embodiment, the spout 9 is integrally bonded to the opening portion 8 using the same resin when the reinforcing resin layer 10 is formed.

Each film constituting the bag body 1 is properly selected according to the method for bonding the films each other and the adhesion properties with the resin layer upon producing the gusset bag of the present invention, and the kind of content to be filled in the gusset bag. When the films are fusion bonded each other upon producing the gusset bag of the present invention, the film should desirably have heat bonding ability. In addition, the film face constituting the outer surface of the gusset bag when the bag is produced should desirably have good adhesion properties with the resin for forming the reinforcing resin layer 10.

The above-mentioned film may be a monolayer film or a multilayer film. Examples of the multilayer films include co-extruded films and laminate films. The monolayer film or the multilayer film may be composed of an oriented or non-oriented polyolefin, nylon, or polyester film or the like. EVOH film, vinylidene chloride film, and ceramics-deposited film etc. are also desirable as gas barrier material. The film is not limited to a plastic film but it includes paper or metal foil (e.g. aluminum foil etc.) in monolayer film or laminate film. It is desirable to use a monolayer plastic film, multilayer plastic film, or plastic laminate film having a different kind of materials such as metal deposited layer, metal foil, and paper.

The film may have a thickness ranging from 20 to 900  $\mu\text{m}$ . A thick film is desirable for self-standing property, but a thin film is desirable for flexibility and light weight. Even a bag of thin film can exhibit the self-standing

property if it is provided with the reinforcing resin layer. A preferable thickness is 60 to 200  $\mu\text{m}$  from the standpoint of moldability and handling property.

5 The spout 9 is not specifically restricted in size and shape. It may have any size and shape suitable for the purpose of use as a packaging bag. The conventional self-standing bag provided with a spout is produced by inserting the spout in the opening portion of the bag body manually or automatically with an inserting machine as an  
10 additional operation, and heat bonding. A big spout often makes it difficult to bond firmly the both sides of the end of the spout and to carry out the fusion bonding operation. On the other hand, such difficulties would not be brought in the present invention, since a thick spout can be integrally  
15 bonded with the reinforcing resin layer 10 or integrally molded with the reinforcing resin layer 10.

The material of the spout 9 is not specifically restricted. It may be properly selected according to the content to be filled in the gusset bag, bonding ability with  
20 the reinforcing resin layer 10, the self-standing property of the gusset bag and so on. Examples of the spout materials include general-purpose resins such as polyethylenes and polypropylenes, engineering resins such as nylons and polyesters, and elastomers. They may be used alone or in  
25 combination with one another in the form of copolymer or blend.

The reinforcing resin layer 10 may be formed from any material identical with or different from that of the spout 9. Such materials are desirable which have properties of  
30 injection molding and bonding with the edge of the bag body 1. Examples of materials of the reinforcing resin layer include general-purpose resins such as polyethylenes and polypropylenes, engineering resins such as nylons and polyesters, elastomer-blended resins, and copolymer resins.

35 The reinforcing resin layer 10 is not specifically restricted in width and thickness. If it is formed on the side edge in a such shape that is tapered off toward its end



(toward the bottom of the bag), then it should desirably have a width ranging from 1 to 20 mm, particularly 5 to 10 mm, and a thickness ranging from 1 to 10 mm, particularly 2 to 5 mm measured at the part of the uniform width. In the case where  
5 almost all the reinforcing resin layer is formed uniform shape, the average width and average thickness should preferably be within the above-mentioned range. With an excessively small width or thickness, the reinforcing resin layer will be difficult to bond to the bag body 1 with a  
10 sufficient attachment strength. With an excessively large width or thickness, it is feared that the reinforcing resin layer needs more resin than that is necessary being undesirable for waste, and prevents the gusset bag from easy opening, and reduces the sufficient volume of the bag.

15 In the case where the reinforcing resin layer on the side edge is formed such that the lower part of the side edge remains uncovered by the reinforcing resin layer 10, the length of the reinforcing resin layer should preferably be 60% or above, particularly 80% or above, of the entire length  
20 of the side edge. In this case, if the length of the uncovered part is equal to the sum of the width of the folded side film and the width of the bottom seal, the reinforcing resin layer 10 formed in this manner reaches the surface on which the bag is placed when the gusset bag is intended to  
25 stand. In addition, the reinforcing resin layer 10 formed in this manner does not exist at the bottom 2. So, these help the bag to stand stably.

The gusset bag body 1 may be produced by any known method. The reinforcing resin layer 10 on the upper edge 7  
30 and side edges of the bag body may be formed by bonding a strip-shaped resin layer previously molded with an adhesive or by heat sealing, or by injecting resin to the upper edge 7 and each side edge. In this case, when the spout 9 is formed at the opening portion 8, it is preferable to mold the spout  
35 9 to the opening portion 9 by injecting the same resin simultaneously with the injection molding of the reinforcing resin layer. Alternatively, it is also possible to mold the

spout in advance and then integrally bond the spout with the reinforcing resin layer 10 upon forming the layer by injecting molten resin to the bag body 1 in a mold.

The gusset bag of the present invention has an  
5 excellent self-standing property although it is flexible. It functions as a packaging bag having self-standing performance and retains its self-standing property until the content therein is completely consumed even though it is provided with spout. After use, it can be folded in a small volume to  
10 discard. Moreover, the gusset bag of the present invention has a high attachment strength of the spout. In addition, the reinforcing resin layer can strengthen the bonding strength of the bag. Accordingly, the gusset bag of the present invention is easy to use, has a high strength as a  
15 packaging bag, and is easy to reduce its volume upon discarding the bag after use. Thus it is suitable for environmental protection. According to the method of producing the gusset bag of the present invention, the gusset bag having the above-described properties and an excellent  
20 strength as a packaging bag can be manufactured with ease and reliability. Moreover, the present invention permits production of various gusset bags having self-standing properties suitable for any content by selecting the material for the bag body, the type of the molded spout, and the type  
25 of the resin properly. The gusset bags of the present invention can be used as a substitution for bottles and cans.